

## **STATEMENT OF BASIS**

IIG MinWool LLC  
Phenix City, AL  
Russell County  
211-0013

This proposed Title V Major Source Operating Permit renewal is issued under the provisions of ADEM Admin. Code R. 335-3-16. The above named applicant has requested authorization to perform the work or operate the facility shown on the application and drawings, plans, and other documents attached hereto or on file with the Air Division of the Alabama Department of Environmental Management, in accordance with the terms and conditions of this permit.

On November 21, 2018, IIG MinWool LLC submitted a letter informing the Department that their name has been formally changed to Johns Manville, effective January 1, 2019. Johns Manville, located in Phenix City, Alabama, is a medium size manufacturing facility that produces a variety of mineral wool insulation products from raw materials.

Johns Manville was issued its existing Major Source Operating Permit (MSOP) on October 15, 2013 with an expiration date of October 14, 2018. Per ADEM Rule 335-3-16-.12(2), an application for permit renewal shall be submitted at least six (6) months, but not more than eighteen (18) months, before the date of expiration of the permit. Based on this rule, the application for renewal was due to the Department no later than May 14, 2018, but no earlier than May 14, 2017. An application for permit renewal was received by the Department on April 16, 2018. No additional information was deemed necessary for processing of this MSOP.

The following are significant sources of air pollution for this facility:

- Cupola with Fiber Formation Process
- Mineral Wool Process – Board Line
- Mineral Wool Process – Pipe Line

**RENEWAL NOTES:**

1. IIG requests revisions to the permit descriptions for several pieces of equipment so that they are consistent with the facility.
2. IIG requests that the current annual compliance testing report due date be changed from within 15 days of completion of testing to within 30 days.
3. New MACT DDD emission limits for formaldehyde, methanol, and phenol went into effect July 30, 2018. These limits are included in this renewal as well as the monitoring and testing requirements associated with the limits.
4. IIG requests a name change from the Industrial Insulation Group MinWool LLC to Johns Manville.

## Mineral Wool Cupola Furnace and Fiber Formation Collection Process

### Process Description:

The raw material blend (basalt, dolomite, and limestone) is loaded into a cupola with coke (no more than 0.7% sulfur content). As the coke is ignited and burned, the mineral charge is heated to the molten state at a desired temperature. Emissions of fugitive PM from this process have been calculated and meet the definition of “Insignificant Activity”. The molten mineral exits the cupola and proceeds to the fiber formation and collection process to be spun into mineral wool fibers. Once the melt is dropped into the spinner (forming drum), long fibers of the melt are formed and phenol formaldehyde resin-based binder is applied. The binder is blown toward a rotating drum under suction. The fiber from the collection area is either kept as a blanket for processing in the Board Insulation Line or rolled into logs for use in the Pipe Insulation Line. The emissions from the cupola are suctioned by negative pressure to the Thermal Oxidizer System that includes a separator, baghouse, and thermal oxidizer. The emissions from the forming drum are sent to Filterhouse #1. The emission point is designated as Stack 101.

### Applicability:

- This source is subject to the applicable requirements of ADEM Admin. Code R. 335-3-16-.03, “*Major Source Operating Permits*”.
- This source is subject to ADEM Admin. Code R. 335-3-4-.04(1), “*Control of Particulate Emissions for Process Industries - General*”. However, this unit has BACT PM limits in place which are more stringent.
- This unit is subject to ADEM Admin. Code R. 335-3-4-.01(1), “*Control of Particulate Emissions – Visible Emissions*”.
- This unit has enforceable limits in place in order to comply with the applicable provisions of ADEM Admin. Code R. 335-3-14-.04. “*Air Permits Authorizing Construction in Clean Air Areas [Prevention of Significant Deterioration]*”.
- Per §63.1177, a mineral wool production facility is subject to the applicable provisions of 40 CFR 63 Subpart DDD, “*National Emission Standards for Hazardous Air Pollutants for Mineral Wool Production*”.
- Per § 63.1194, a mineral wool production facility is subject to the applicable provisions of 40 CFR 63 Subpart A, “*General Provisions*” as listed in Table 1 of 40 CFR 63 Subpart DDD.
- This cupola is subject to 40 CFR 64, *Compliance Assurance Monitoring*. Pre-control potential carbon monoxide emissions exceed 100 TPY.

### Emissions Standards:

- **Opacity**

- ADEM Admin. Code R. 335-3-4-.01(1)(a)(b), states no person shall discharge particulate emissions of an opacity greater than that designated as twenty (20%) opacity, as determined by a six minute average. During one six (6) minute period in any sixty (60) minute period, a person may discharge into the atmosphere from any source of emission forty (40%) percent opacity.

- **Particulate Matter**

- The combined particulate matter (PM) emissions from the Cupola, Fiber Formation/Collection Process, Mineral Wool Process (Board Line), and Mineral Wool Process (Pipe Insulation Lines) shall not exceed 117.0 (lb/hr) pounds per hour. (*ADEM Admin. Code 335-3-14-.04(9) BACT*)
- Particulate matter (PM) emissions from each existing, new, or reconstructed cupola shall not exceed 0.05 kilograms (kg) of PM per megagram (MG) (0.10 pound [lb] of PM per ton) of melt. (*40 CFR §63.1178(a)(1) Subpart DDD*)
- The Permittee must comply with these standards (Subpart DDD) at all times except during periods of startup, shutdown, or malfunction. (*40 CFR §63.1180 Subpart DDD*)

- **Operating**

- The cupola shall be vented to a baghouse and an oxidizer in series. (*ADEM Admin. Code 335-3-14-.04(9) BACT*)
- The three-hour average temperature in the firebox of the thermal oxidizer on the cupola shall not be less than 1320°F while the cupola is operating. (*ADEM Admin. Code 335-3-14-.04(9) BACT*)
- The baghouse and oxidizer shall not be bypassed during startup or for more than four (4) hours during shutdown periods. (*ADEM Admin. Code 335-3-14-.04(9) BACT*)
- The pressure drop across the baghouse shall not drop below 0.2 inches of water column while the cupola is operating. (*ADEM Admin. Code 335-3-14-.04(9) BACT*)
- Begin within one hour after the alarm on a bag leak detection system sounds, and complete in a timely manner, corrective actions as specified in your operations, maintenance, and monitoring plan required by §63.1187 of 40 CFR 63 Subpart DDD. (*40 CFR §63.1178(b)(1) Subpart DDD*)
- When the alarm on a bag leak detection system sounds for more than five percent of the total operating time in a six-month reporting period, develop and implement a written quality improvement plan (QIP) consistent with the compliance assurance

monitoring requirements of §64.8(b)–(d) of 40 CFR part 64. (40 CFR §63.1178(b)(2) Subpart DDD)

- ***Sulfur Dioxide***

- Sulfur dioxide emissions from the cupola shall not exceed 88.5 (lb/hr) pounds per hour. (ADEM Admin. Code 335-3-14-.04(9) BACT)
- Only coke derived from coal shall be used as fuel. Such coke shall not contain sulfur which exceeds 0.7% by weight. (ADEM Admin. Code 335-3-14-.04(9) BACT)

- ***Carbon Monoxide***

- Carbon monoxide emissions from the cupola shall not exceed 17.0 (lb/hr) pounds per hour. (ADEM Admin. Code 335-3-14-.04(9) BACT) – goes away after 7/30/18?

- ***Nitrogen Oxide***

- Nitrogen oxide emissions from the cupola shall not exceed 15.0 (lb/hr) pounds per hour. (ADEM Admin. Code 335-3-14-.04(9) BACT)

- ***Hydrogen Sulfide***

- Hydrogen sulfide (H<sub>2</sub>S) emissions from the cupola shall not exceed 1.0 (lb/hr) pound per hour. (ADEM Admin. Code 335-3-14-.04(9) BACT)

- ***Carbonyl Sulfide***

- Carbonyl sulfide (COS) emissions from the cupola shall not exceed 3.4 pounds per ton of melt. (40 CFR §63.1178(a) Subpart DDD)

- ***Hydrogen Fluoride***

- Hydrogen fluoride (HF) emissions from the cupola shall not exceed 0.13 pounds per ton of melt. (40 CFR §63.1178(a) Subpart DDD)

- ***Hydrogen Chloride***

- Hydrogen chloride (HCl) emissions from the cupola shall not exceed 0.43 pounds per ton of melt. (40 CFR §63.1178(a) Subpart DDD)

- ***Formaldehyde***

- Formaldehyde emissions from the fiber formation collection process shall not exceed 0.17 lb per ton melt. (*40 CFR §63.1178(a) Subpart DDD*)
- **Methanol**
  - Methanol emissions from the fiber formation collection process shall not exceed 0.28 lb per ton melt. (*40 CFR §63.1178(a) Subpart DDD*)
- **Phenol**
  - Phenol emissions from the fiber formation collection process shall not exceed 0.85 lb per ton melt. (*40 CFR §63.1178(a) Subpart DDD*)

Compliance and Performance Test Methods and Procedures:

- If testing is required, the nitrogen oxide (NO<sub>x</sub>) emissions shall be determined by Methods 7, 7a, 7b, or 7e of 40 CFR 60, Appendix A. (*ADEM Admin. Code 335-3-1-.05*)
- If testing is required, the carbon monoxide (CO) emissions shall be determined by Methods 10 or 10b of 40 CFR 60, Appendix A. (*ADEM Admin. Code 335-3-1-.05*)
- If testing is required, particulate matter emissions shall be determined by Method 5e of 40 CFR Part 60, Appendix A. (*ADEM Admin. Code 335-3-1-.05*)
- If testing is required, the hydrogen sulfide emissions shall be determined by Method 11 of 40 CFR Part 60, Appendix A. (*ADEM Admin. Code 335-3-1-.05*)
- If testing is required, sulfur dioxide emissions shall be determined by Methods 6 or 6c of 40 CFR Part 60, Appendix A. (*ADEM Admin. Code 335-3-1-.05*)
- If testing is required, carbonyl sulfide, formaldehyde, phenol, and methanol emissions shall be determined by Method 318 of 40 CFR Part 60, Appendix A. (*40 CFR §63.1189 Subpart DDD*)
- If testing is required, hydrogen fluoride and hydrogen chloride emissions shall be determined by Method 26A or 320 of 40 CFR Part 60, Appendix A. (*40 CFR §63.1189 Subpart DDD*)
- To comply with the PM standards of Subpart DDD, you must meet all of the following: (*40 CFR §63.1181 Subpart DDD*)
  - Install, adjust, maintain, and continuously operate a bag leak detection system for each fabric filter.
  - Do a performance test as specified in §63.1188 of this subpart and show compliance with the PM emission limits while the bag leak detection system is installed, operational, and properly adjusted.

- Begin corrective actions specified in your operations, maintenance, and monitoring plan required by §63.1187 of this subpart within one hour after the alarm on a bag leak detection system sounds. Complete the corrective actions in a timely manner.
- Develop and implement a written QIP consistent with compliance assurance monitoring requirements of 40 CFR 64.8(b) through (d) when the alarm on a bag leak detection system sounds for more than five percent of the total operating time in a six-month reporting period.
- To comply with the COS, HF, and HCl standards of Subpart DDD, you must meet all of the following: (*40 CFR §63.1182 Subpart DDD*)
  - Install, calibrate, maintain, and operate a device that continuously measures the operating temperature in the firebox of each thermal incinerator.
  - Conduct a performance test as specified in §63.1188 that shows compliance with the COS, HF, and HCl emissions limits while the device for measuring incinerator operating temperature is installed, operating, and properly calibrated. Establish the average operating temperature based on the performance test as specified in §63.1185(a).
  - Following the performance test, measure and record the average operating temperature of the incinerator as specified in §63.1185(b).
  - Maintain the operating temperature of the incinerator so that the average operating temperature for each three-hour block period never falls below the average temperature established during the performance test.
  - Operate and maintain the incinerator as specified in your operations, maintenance, and monitoring plan required by §63.1187.
- To comply with the formaldehyde, phenol, and methanol standards of Subpart DDD, you must meet all of the following: (*40 CFR §63.1183 Subpart DDD*)
  - Install, calibrate, maintain, and operate a device that continuously measures the operating temperature in the firebox of each thermal incinerator.
  - Conduct a performance test as specified in §63.1188 while manufacturing the product that requires a binder formulation made with the resin containing the highest free-formaldehyde content specification range. Show compliance with the formaldehyde, phenol, and methanol emissions limits, specified in Table 2 to this subpart, while the device for measuring the control device operating parameter is installed, operational, and properly calibrated. Establish the average operating parameter based on the performance test as specified in §63.1185(a).
  - During the performance test that uses the binder formulation made with the resin containing the highest free-formaldehyde content specification range, record the free-formaldehyde content specification range of the resin used, and the formulation of the binder used, including the formaldehyde content and binder specification.
  - Following the performance test, monitor and record the free-formaldehyde content of each resin lot and the formulation of each batch of binder used, including the formaldehyde, phenol, and methanol content.

- Maintain the free-formaldehyde content of each resin lot and the formaldehyde content of each binder formulation at or below the specification ranges established during the performance test.
  - Following the performance test, measure and record the average operating temperature of the incinerator as specified in §63.1185(b) of this subpart.
  - Maintain the operating temperature of the incinerator so that the average operating temperature for each three-hour block period never falls below the average temperature established during the performance test.
  - Operate and maintain the incinerator as specified in your operations, maintenance, and monitoring plan required by §63.1187 of this subpart.
- The performance tests conducted to demonstrate compliance with the emissions limits in §63.1178 shall conform to the test methods and procedures specified in §63.1188 and §63.1189.
  - Using the results of the performance tests, the facility must use the following equation to determine compliance with the PM emission limit: (40 CFR §63.1190(a) Subpart DDD)

$$E = \frac{C \times Q \times K_1}{P} \text{ Where:}$$

E = Emission rate of PM, kg/Mg (lb/ton) of melt.

C = Concentration of PM, g/dscm (gr/dscf).

Q = Volumetric flow rate of exhaust gases, dscm/hr (dscf/hr).

K<sub>1</sub> = Conversion factor, 1 kg/1,000 g (1 lb/7,000 gr).

P = Average melt rate, Mg/hr (ton/hr).

- Using the results from the performance tests, the facility must use the following equation to determine compliance with the carbonyl sulfide, hydrogen fluoride, and hydrogen chloride emission limits: (40 CFR §63.1190(b) Subpart DDD)

$$E = \frac{C \times MW \times Q \times K_1 \times K_2}{K_3 \times P \times 10^6} \text{ Where:}$$

E = Emission rate of measured pollutant, kg/Mg (lb/ton) of melt.

C = Measured volume fraction of pollutant, ppm.

MW = Molecular weight of measured pollutant, g/g-mole: Carbonyl sulfide = 60.07, hydrogen fluoride = 20.01, hydrogen chloride = 36.46.



Q = Volumetric flow rate of exhaust gases, dscm/hr (dscf/hr).

K<sub>1</sub> = Conversion factor, 1 kg/1,000 g (1 lb/453.6 g).

K<sub>2</sub> = Conversion factor, 1,000 L/m<sup>3</sup> (28.3 L/ft<sup>3</sup>).

K<sub>3</sub> = conversion factor, 24.45 L/g-mole.

P = Average melt rate, Mg/hr (ton/hr).

CAM Analysis:

Source	Pollutant	Pre-control Emissions (>100 TPY)?	Controlled?	Emission Limit?	CAM Applicable?	If not, why?
Cupola	CO	Yes	Yes	Yes	Yes	
	H <sub>2</sub> S	No	Yes	Yes	No	<100 tpy
	NO <sub>x</sub>	No	No	No	No	Not controlled
	PM	Yes	Yes	Yes	No	Subject to post 1990 rule (40 CFR Subpart DDD)
	SO <sub>2</sub>	No	No	Yes	No	Not controlled
Board Line Oven	PM	No	Yes	Yes	No	<100 tpy
	NO <sub>x</sub>	No	No	No	No	Not controlled
	VOC	No	No	No	No	Not controlled
Board Line Cooler	PM	No	No	No	No	Not controlled
	VOC	No	No	No	No	Not controlled
Pipe Lines	PM	No	Yes	Yes	No	<100 tpy
	VOC	No	No	No	No	Not controlled

Cupola Particulate Matter

*MACT Monitoring*

- 40 CFR 63 Subpart DDD was adopted after November 15, 1990. The monitoring requirements specified in the subpart (detailed below) are sufficient to satisfy CAM:
  - Begin within one hour after the alarm on a bag leak detection system sounds, and complete in a timely manner, corrective actions as specified in your operations, maintenance, and monitoring plan required by §63.1187 of this subpart.
  - When the alarm on a bag leak detection system sounds for more than five percent of the total operating time in a six-month reporting period, develop and implement a written quality improvement plan (QIP) consistent with the compliance assurance monitoring requirements of §64.8(b)–(d) of 40 CFR part 64.
  - Install, adjust, maintain, and continuously operate a bag leak detection system for each fabric filter.
  - Do a performance test as specified in §63.1188 of this subpart and show compliance with the PM emission limits while the bag leak detection system is installed, operational, and properly adjusted.
  - Begin corrective actions specified in your operations, maintenance, and monitoring plan required by §63.1187 of this subpart within one hour after the alarm on a bag leak detection system sounds. Complete the corrective actions in a timely manner.
  - Develop and implement a written QIP consistent with compliance assurance monitoring requirements of 40 CFR 64.8(b) through (d) when the alarm on a bag leak detection system sounds for more than five percent of the total operating time in a six-month reporting period.
  - A bag leak detection system must meet the following requirements:
    - The bag leak detection system must be certified by the manufacturer to be capable of detecting PM emissions at concentrations of 10 milligrams per actual cubic meter (0.0044 grains per actual cubic foot) or less.
    - The sensor on the bag leak detection system must provide output of relative PM emissions.
    - The bag leak detection system must have an alarm that will sound automatically when it detects an increase in relative PM emissions greater than a preset level.
    - The alarm must be located in an area where appropriate plant personnel will be able to hear it.
    - For a positive-pressure fabric filter, each compartment or cell must have a bag leak detector. For a negative-pressure or induced-air fabric filter, the bag leak detector must be installed downstream of the fabric filter. If multiple bag leak detectors are required (for either type of fabric filter), detectors may share the system instrumentation and alarm.
    - Each triboelectric bag leak detection system must be installed, operated, adjusted, and maintained so that it follows EPA's "Fabric Filter Bag Leak Detection Guidance" (EPA-454/R-98-015, September 1997). Other bag leak detection

systems must be installed, operated, adjusted, and maintained so that they follow the manufacturer's written specifications and recommendations.

- After initial adjustment, the range, averaging period, alarm set points, or alarm delay time may not be adjusted except as specified in the operations, maintenance, and monitoring plan required by §63.1187 of this subpart. In no event may the range be increased by more than 100 percent or decreased by more than 50 percent over a 365 day period unless a responsible official as defined in §63.2 of the general provisions in subpart A of this part certifies in writing to the Administrator that the fabric filter has been inspected and found to be in good operating condition.

### Cupola Carbon Monoxide

#### *Monitoring*

- The facility proposes to continue complying with existing CAM plan:

#### MONITORING APPROACH: Gas-fired Incinerator

	Indicator No. 1	Indicator No. 2
I. Indicator	Cupola Incinerator Temperature	Inspection and Maintenance Provisions
Measurement Approach	Cupola incinerator temperature will be monitored continuously when the cupola is in operation.	Follow procedures in section 63.1187(b)(3) of 40 CFR 63 Subpart DDD
II. Indicator Range	Cupola incinerator temperature will be maintained at or above 1320°F while the cupola is in operation (excludes startup and shutdown).	Follow procedures in section 63.1187(b)(3) of 40 CFR 63 Subpart DDD
III. Performance Criteria Data Representativeness	Cupola incinerator temperature will be monitored with a temperature indicating device installed in the combustion chamber of the incinerator, providing directly representative data.	Follow procedures in section 63.1187(b)(3) of 40 CFR 63 Subpart DDD
Verification of Operation Status	When operational, cupola incinerator temperature indicator will display the incinerator temperature.	Documented completion of inspection and maintenance activities in accordance with section 63.1187(b)(3) of 40 CFR 63 Subpart DDD
QA/QC Practices and Criteria	Cupola incinerator temperature will be automatically recorded.	Persons performing the inspection and maintenance will be trained in proper techniques and provided the proper background to

		effectively perform the inspection and maintenance
Monitoring Frequency	Cupola incinerator temperature is monitored continuously.	At least once per year
Data Collection Procedures	Automatic.	Records of completions of inspection and maintenance
Averaging period	N/A	N/A

### *Justification*

#### *Rationale for Selection of Performance Indicators*

Incinerator combustion chamber temperature was selected as a performance indicator based on its correlation to destruction efficiency for CO and other organics. Generally, higher temperature offer better destruction efficiency for organics. The minimum temperature is highly dependent of the types of organics being controlled, the residence time in the unit, and the desired destruction efficiency. For IIG MinWool's Cupola #1, the minimum incinerator temperature of 1320°F was chosen since it is equal to the current permit limit where compliance with the emissions limit of 17 lb CO/hr has been established by past source tests. Continued monitoring of the incinerator temperature will provide reasonable assurance that the control efficiency of the incinerator and compliance with the emissions limit of 17.0 lb CO/hr is being maintained.

Inspection and maintenance procedures in 40 CFR §63.1187(b)(3) were selected as a performance indicator based on their direct impact on CO destruction efficiency. Improper maintenance can result in lower destruction efficiencies and increased CO emissions from such items as (including but not limited to):

- Improper burner adjustment
- Insufficient air flow
- Hot or cold spots due to refractory deterioration
- Improper adjustment of controls, motors, etc.

Periodic inspection and maintenance will ensure the incinerator is operating as design for maximum control efficiency. Please note: the chosen inspection and maintenance provisions are already being conducted as part of compliance method for Subpart DDD for PM<sub>10</sub> emissions from Cupola #1.

#### *Rationale for Selection of Indicator Ranges*

For incinerator temperature, the selected indicator range is any temperature at or above 1320°F. This temperature corresponds to a current permit limitation established as part of a past permitting action for compliance with the PSD limit of 17.0 lb CO/hr.

There is no indicator range for the inspection and maintenance procedures, other than maintaining accurate records of all inspection and maintenance procedures.

### *Performance Test*

Compliance source tests for CO are conducted annually. Results of these source tests indicate continued compliance with the CO emissions limit of 17.0 lb/hr and minimum cupola incinerator temperature of 1320°F. No significant changes have been made to the cupola, incinerator, or temperature indicating systems.

### Emission Monitoring:

- Carbon Monoxide emissions monitoring requirements under 40 CFR Part 64, “*Compliance Assurance Monitoring*” can be found in the CAM analysis section below.
- A monitoring device that continuously measures and records the firebox temperature of the incinerator on the cupola shall be installed, calibrated, maintained, and operated. (*ADEM Admin. Code 335-3-1-.04*)
- Instruments which measure the pressure drop across the filterhouses shall be maintained and operated. (*ADEM Admin. Code 335-3-1-.04*)
- During the annual compliance test, minimum pressure drops shall be determined for the filterhouses. (*ADEM Admin. Code 335-3-1-.04*)
- Pressure drop across each filterhouse shall be monitored and recorded daily, except when the source of pollution to the filterhouse is not being operated. (*ADEM Admin. Code 335-3-1-.04*)
- Emissions tests on Stack 101 are to be conducted for the following pollutants at intervals not to exceed one year following the date of previous compliance testing. All test reports must be submitted to the Department within 30 days of completion of testing. (*ADEM Admin. Code 335-3-1-.04*)

Particulate                      ☒      Carbon Monoxides                      ☒  
Sulfur Dioxide   ☒

- A bag leak detection system must meet the following requirements: (*40 CFR §63.1184 Subpart DDD*)
  - The bag leak detection system must be certified by the manufacturer to be capable of detecting PM emissions at concentrations of 10 milligrams per actual cubic meter (0.0044 grains per actual cubic foot) or less.
  - The sensor on the bag leak detection system must provide output of relative PM emissions.

- The bag leak detection system must have an alarm that will sound automatically when it detects an increase in relative PM emissions greater than a preset level.
  - The alarm must be located in an area where appropriate plant personnel will be able to hear it.
  - For a positive-pressure fabric filter, each compartment or cell must have a bag leak detector. For a negative-pressure or induced-air fabric filter, the bag leak detector must be installed downstream of the fabric filter. If multiple bag leak detectors are required (for either type of fabric filter), detectors may share the system instrumentation and alarm.
  - Each triboelectric bag leak detection system must be installed, operated, adjusted, and maintained so that it follows EPA's "Fabric Filter Bag Leak Detection Guidance" (EPA-454/R-98-015, September 1997). Other bag leak detection systems must be installed, operated, adjusted, and maintained so that they follow the manufacturer's written specifications and recommendations.
  - At a minimum, initial adjustment of the system must consist of establishing the baseline output in both of the following ways:
    - Adjust the range and the averaging period of the device.
    - Establish the alarm set points and the alarm delay time
  - After initial adjustment, the range, averaging period, alarm set points, or alarm delay time may not be adjusted except as specified in the operations, maintenance, and monitoring plan required by §63.1187 of this subpart. In no event may the range be increased by more than 100 percent or decreased by more than 50 percent over a 365 day period unless a responsible official as defined in §63.2 of the general provisions in subpart A of this part certifies in writing to the Administrator that the fabric filter has been inspected and found to be in good operating condition
- An operations, maintenance, and monitoring plan must be submitted to the Administrator for review and approval as part of the application for the title V permit. (*40 CFR §63.1187(a) Subpart DDD*)
  - The facility may change control device and process operating parameter levels established during performance tests and used to monitor compliance if you do the following: (*40 CFR §63.1186 Subpart DDD*)
    - The facility must notify the Administrator of your desire to expand the range of a control device or process operating parameter level.
    - Upon approval from the Administrator, the facility must conduct additional performance tests at the proposed new control device or process operating parameter levels. Before operating at these levels, the performance test results must verify that, at the new levels, the facility comply with the emission limits in §§63.1178 and 63.1179 of this subpart.
  - The operations, maintenance, and monitoring plan must include the following: (*40 CFR §63.1187(b) Subpart DDD*)

- Process and control device parameters the facility will monitor to determine compliance, along with established operating levels or ranges for each process or control device.
- A monitoring schedule.
- Procedures for properly operating and maintaining control devices used to meet the standards in §§63.1178 and 63.1179 of this subpart. These procedures must include an inspection of each incinerator at least once per year. At a minimum, the facility must do the following as part of an incinerator inspection:
  - Inspect all burners, pilot assemblies, and pilot sensing devices for proper operation. Clean pilot sensor if necessary.
  - Ensure proper adjustment of combustion air, and adjust if necessary.
  - Inspect, when possible, all internal structures (such as baffles) to ensure structural integrity per the design specifications.
  - Inspect dampers, fans, and blowers for proper operation.
  - Inspect motors for proper operation.
  - Inspect, when possible, combustion chamber refractory lining. Clean, and repair or replace lining if necessary.
  - Inspect incinerator shell for proper sealing, corrosion, and/or hot spots.
  - For the burn cycle that follows the inspection, document that the incinerator is operating properly and make any necessary adjustments.
  - Generally observe whether the equipment is maintained in good operating condition.
  - Complete all necessary repairs as soon as practicable.
- Procedures for keeping records to document compliance.
- Corrective actions the facility will take if process or control device parameters vary from the levels established during performance testing.

Recordkeeping and Reporting Requirements:

- Records shall be maintained of the sulfur content of the coke used in the cupola. (*ADEM Admin. Code 335-3-1-.04*)
- A semi-annual monitoring report shall be submitted to the Department according the following schedule: (*ADEM Admin. Code 335-3-16-.05(c)(3)*)

<b>Reporting Period</b>	<b>Due Date</b>
<i>January 1<sup>st</sup> to June 30<sup>th</sup></i>	<i>August 31<sup>st</sup></i>
<i>July 1<sup>st</sup> to December 31<sup>st</sup></i>	<i>February 28<sup>th</sup></i>

- A report shall be submitted semi-annually which contains the following:
  - The periods when firebox temperate in the incinerator on the cupola was below 1320°F and the corrective action taken;
  - The periods when the pressure drops across the filterhouses were below the minimum pressure determined during the annual stack tests;

- All record shall be maintained for a minimum of 5 years. (*ADEM Admin. Code 335-3-16-.05(c)(2)*)
- This source shall comply with the notification requirements specified in 63.1191. (*40 CFR §63.1191 Subpart DDD*)
- The facility must meet the following recordkeeping requirements: (*40 CFR §63.1192 Subpart DDD*)
  - Maintain files of all information required by §63.10(b) of the general provisions in subpart A of this part, including all notifications and reports.
  - Maintain records of the following information also:
    - Cupola production (melt) rate (Mg/hr (tons/hr) of melt).
    - All bag leak detection system alarms. Include the date and time of the alarm, when corrective actions were initiated, the cause of the alarm, an explanation of the corrective actions taken, and when the cause of the alarm was corrected.
    - Incinerator operating temperature and results of incinerator inspections. For all periods when the average temperature in any three-hour block period fell below the average temperature established during the performance test, and all periods when the inspection identified incinerator components in need of repair or maintenance, include the date and time of the problem, when corrective actions were initiated, the cause of the problem, an explanation of the corrective actions taken, and when the cause of the problem was corrected.
  - Retain each record for at least five years following the date of each occurrence, measurement, corrective action, maintenance, record, or report. The most recent two years of records must be retained at the facility. The remaining three years of records may be retained off site.
  - Retain records on microfilm, on a computer, on computer disks, on magnetic tape disks, or on microfiche.
  - Report the required information on paper or on a labeled computer disk using commonly available and compatible computer software.
- The facility must prepare and submit reports to the Administrator as required by 40 CFR 63 Subpart DDD and §63.10 of the general provisions in subpart A of this part. These reports include, but are not limited to, the following:
  - A performance test report, as required by §63.10(d)(2) of the general provisions in subpart A of this part, that documents the process and control equipment operating parameters during the test period, the test methods and procedures, the analytical procedures, all calculations, and the results of the performance tests.
  - A startup, shutdown, and malfunction plan, as described in §63.6(e)(3) of the general provisions in subpart A of this part, that contains specific procedures for operating and maintaining the source during periods of startup, shutdown, and malfunction and a program of corrective action for malfunctioning process and control systems used to comply with the emission standards. In addition to the information required by §63.6(e)(3), the plan must include the following:



- Procedures to determine and record what caused the malfunction and when it began and ended.
- Corrective actions the facility will take if a process or control device malfunctions, including procedures for recording the actions taken to correct the malfunction or minimize emissions.
- An inspection and maintenance schedule for each process and control device that is consistent with the manufacturer's instructions and recommendations for routine and long-term maintenance.
- A report of each event as required by §63.10(b) of the general provisions in subpart A of this part, including a report if an action taken during a startup, shutdown, or malfunction is inconsistent with the procedures in the plan as described in §63.6(e)(3) of the general provisions in subpart A of this part.
- An operations, maintenance, and monitoring plan as specified in §63.1187 of this subpart.
- A semiannual report as required by §63.10(e)(3) of the general provisions in subpart A of this part if measured emissions exceed the applicable standard or a monitored parameter varies from the level established during performance testing. The report must contain the information specified in §63.10(c) of the general provisions, as well as the relevant records required by §63.1192(b) of this subpart.
- A semiannual report stating that no excess emissions or deviations of monitored parameters occurred during the reporting period as required by §63.10(e)(3)(v) of the general provisions in subpart A of this part if no deviations have occurred.
- Semi-annual monitoring report required by 40 CFR 63 Subpart DDD shall be submitted to the Department according the following schedule: (40 CFR §60.10(a)(5))

<b>Reporting Period</b>	<b>Due Date</b>
<i>January 1<sup>st</sup> to June 30<sup>th</sup></i>	<i>August 31<sup>st</sup></i>
<i>July 1<sup>st</sup> to December 31<sup>st</sup></i>	<i>February 28<sup>th</sup></i>

#### Emissions:

Emission data is based on AP-42 emissions factor and mass balance. Per air permit application forms submitted, emissions from these units are as follows:

<b>Emission Point</b>	<b>Pollutant</b>	<b>Allowable Emissions</b>		<b>Expected Emissions</b>	
		<b>(lb/hr)</b>	<b>(TPY)</b>	<b>(lb/hr)</b>	<b>(TPY)</b>
101	CO	17.0	74.46	7.83	34.29
101	SO <sub>2</sub>	88.5	387.63	21.52	94.25
101	PM*	117.0	512.46	0.73	3.18
101	NO <sub>x</sub>	15.0	65.7	12.22	53.53
101	VOC			14.14	61.94
101	CO <sub>2</sub> e			8,827.6	38,663.7
101	Total HAP			16.02	70.17

\* - combined limit

## Mineral Wool Process – Board Line

### Process Description:

The board line oven receives the “blanket” of bonded fibers from the fiber formation and collection process. The oven is a series of two conveyors that transport and compress the fiber into the final thickness and density. The fiber is cured as the thermal setting phenol formaldehyde is heated and sets the product dimensions. There are two gas fired burners for the oven, one for thermal destruction and the other to heat the curing air. The curing air is forced through the fiber, then drawn into the thermal destruction chamber that is maintained at a minimum of 1,200 F. This air then passes back through the top of the oven to pre-heat the top oven conveyor before it is sent to Filter House #3. The semi-finished blanket of product emerges from the oven over a conveyor that suctions ambient air through the fiber to cool the product. This air is exhausted untreated through the roof. The cooled board insulation is cut, packaged, and moved to the warehouse. Trimmings are recycled to the Forming unit, and emissions from the handling and processing of the recyclable material are controlled by Filter House #2. The designated stack for this process is Stack 102.

### Applicability:

- This source is subject to the applicable requirements of ADEM Admin. Code R. 335-3-16-.03, *“Major Source Operating Permits”*.
- This source is subject to ADEM Admin. Code R. 335-3-4-.04(1), *“Control of Particulate Emissions for Process Industries - General”*. However, this unit has PM limits in place which are more stringent.
- This unit is subject to ADEM Admin. Code R. 335-3-4-.01(1), *“Control of Particulate Emissions – Visible Emissions”*.
- This unit has enforceable limits in place in order to comply with the applicable provisions of ADEM Admin. Code R. 335-3-14-.04, *“Air Permits Authorizing Construction in Clean Air Areas [Prevention of Significant Deterioration]”*.
- Per §63.1177, a mineral wool production facility is subject to the applicable provisions of 40 CFR 63 Subpart DDD, *“National Emission Standards for Hazardous Air Pollutants for Mineral Wool Production”*.
- Per § 63.1194, a mineral wool production facility is subject to the applicable provisions of 40 CFR 63 Subpart A, *“General Provisions”* as listed in Table 1 of 40 CFR 63 Subpart DDD.

### Emissions Standards:

- *Opacity*

- ADEM Admin. Code R. 335-3-4-.01(1)(a)(b), states no person shall discharge particulate emissions of an opacity greater than that designated as twenty (20%) opacity, as determined by a six minute average. During one six (6) minute period in any sixty (60) minute period, a person may discharge into the atmosphere from any source of emission forty (40%) percent opacity.
- **Particulate Matter**
  - The combined particulate matter (PM) emissions from processes the Cupola, Fiber Formation/Collection Process, Mineral Wool Process (Board Line), and Mineral Wool Process (Pipe Insulation Line) shall not exceed 117.0 (lb/hr) pounds per hour. (ADEM Admin. Code 335-3-14-.04(9) BACT)
- **Operating**
  - The baghouse and incinerator shall not be bypassed during startup or for more than four (4) hours during shutdown periods. (ADEM Admin. Code 335-3-14-.04(9))
  - Maintain the free-formaldehyde content of each resin lot and the formaldehyde content of each binder formulation at or below the specification ranges of the resin and binder used during the performance test. (40 CFR §63.1179(b)(1) Subpart DDD)
  - Maintain the operating temperature of each incinerator so that the average operating temperature for each three-hour block period never falls below the average temperature established during the performance test. (40 CFR §63.1179(b)(2) Subpart DDD)
  - The Permittee must comply with these standards (Subpart DDD) at all times except during periods of startup, shutdown, or malfunction. (40 CFR §63.1180 Subpart DDD)
  - The temperature in the firebox of the afterburner on the curing oven shall not be less than 1200°F while the curing oven is operating. (ADEM Admin. Code 335-3-14-.04(9) BACT)
- **Formaldehyde**
  - Formaldehyde emissions from the curing process shall not exceed 0.17 lb per ton melt. (40 CFR §63.1178(a) Subpart DDD)
- **Methanol**
  - Methanol emissions from the curing process shall not exceed 0.28 lb per ton melt. (40 CFR §63.1178(a) Subpart DDD)
- **Phenol**

- Phenol emissions from the curing process shall not exceed 0.85 lb per ton melt. (*40 CFR §63.1178(a) Subpart DDD*)
- The facility must control emissions from each existing, new, or reconstructed curing oven by limiting emissions of formaldehyde to either of the following: (*40 CFR §63.1179(a) Subpart DDD*)
  - 0.03 kg of formaldehyde per MG (0.06 lb of formaldehyde per ton) of melt or less.
  - A reduction of uncontrolled formaldehyde emissions by at least 80 percent.

Compliance and Performance Test Methods and Procedures:

- If testing is required, particulate matter emissions shall be determined by Method 5e of 40 CFR Part 60, Appendix A. (*ADEM Admin. Code 335-3-1-.05*)
- If testing is required, formaldehyde, phenol, and methanol emissions shall be determined by Method 318 of 40 CFR Part 60, Appendix A. (*40 CFR §63.1189 Subpart DDD*)
- To comply with the formaldehyde standards, the facility must meet all of the following: (*40 CFR §63.1183 Subpart DDD*)
  - Install, calibrate, maintain, and operate a device that continuously measures the operating temperature in the firebox of each thermal incinerator.
  - Do a performance test as specified in §63.1188 of this subpart while manufacturing the product that requires a binder formulation made with the resin containing the highest free-formaldehyde content specification range. Show compliance with the formaldehyde emission limits while the device for measuring incinerator operating temperature is installed, operational, and properly calibrated. Establish the average operating temperature as specified in §63.1185(a) of this subpart.
  - During the performance test that uses the binder formulation made with the resin containing the highest free-formaldehyde content specification range, record the free-formaldehyde content specification range of the resin used, and the formulation of the binder used, including the formaldehyde content and binder specification.
  - Following the performance test, monitor and record the free-formaldehyde content of each resin lot and the formulation of each batch of binder used, including the formaldehyde content.
  - Maintain the free-formaldehyde content of each resin lot and the formaldehyde content of each binder formulation at or below the specification ranges established during the performance test.
  - Following the performance test, measure and record the average operating temperature of the incinerator as specified in §63.1185(b) of this subpart.

- Maintain the operating temperature of the incinerator so that the average operating temperature for each three-hour block period never falls below the average temperature established during the performance test.
- Operate and maintain the incinerator as specified in your operations, maintenance, and monitoring plan required by §63.1187 of this subpart.
- With prior approval from the Administrator, the facility may do short-term experimental production runs using resin where the free-formaldehyde content, or binder formulations where the formaldehyde content, is higher than the specification ranges of the resin and binder used during previous performance tests, or using experimental pollution prevention process modifications without first doing additional performance tests. Notification of intent to perform a short-term experimental production run must include the following information:
  - The purpose of the experimental run.
  - The affected production process.
  - How the resin free-formaldehyde content or binder formulation will deviate from previously approved levels or what the experimental pollution prevention process modifications are.
  - The duration of the experimental run.
  - The date and time of the experimental run.
  - A description of any emissions testing to be done during the experimental run.
- The performance tests conducted to demonstrate compliance with the emissions limits in §63.1178 shall conform to the test methods and procedures specified in §63.1188 and §63.1189.
- Using the results of the performance tests, the facility must use the following equation to determine compliance with the CO and formaldehyde numerical emission limits: (*40 CFR §63.1190 Subpart DDD*)

$$E = \frac{C \times MW \times O \times K_1 \times K_2}{K_3 \times P \times 10^6}$$

where:

E = Emission rate of measured pollutant, kg/Mg (lb/ton) of melt.

C = Measured volume fraction of pollutant, ppm.

MW = Molecular weight of measured pollutant, g/g-mole:

Formaldehyde = 30.03.

Q = Volumetric flow rate of exhaust gases, dscm/hr (dscf/hr).

K<sub>1</sub> = Conversion factor, 1 kg/1,000 g (1 lb/453.6 g).

K<sub>2</sub>= Conversion factor, 1,000 L/m<sup>3</sup> (28.3 L/ft<sup>3</sup> ).

K<sub>3</sub>= Conversion factor, 24.45 L/g-mole.

P = Average melt rate, Mg/hr (ton/hr).

CAM Analysis:

Source	Pollutant	Pre-control Emissions (>100 TPY)?	Controlled?	Emission Limit?	CAM Applicable?	If not, why?
Board Line Oven	PM	No	Yes	Yes	No	<100 tpy*
	NO <sub>x</sub>	No	No	No	No	Not controlled
	VOC	No	No	No	No	Not controlled
Board Line Cooler	PM	No	No	No	No	Not controlled
	VOC	No	No	No	No	Not controlled

\*Though this process is subject to a combined limit of 117 lb/hr, the board line is not capable to emit particulate that quantity itself. The Board Line has the PTE 37.16 tpy of uncontrolled particulate.

Emission Monitoring:

- A monitoring device that continuously measures and records the firebox temperature of the afterburner on the curing oven shall be installed, calibrated, maintained, and operated. (ADEM Admin. Code 335-3-14-.04(9))
- Instruments which measure the pressure drop across the filterhouses shall be maintained and operated. (ADEM Admin. Code 335-3-1-.04)
- During the annual compliance test, minimum pressure drops shall be determined for the filterhouses. (ADEM Admin. Code 335-3-1-.04)
- Pressure drop across each filterhouse shall be monitored and recorded daily, except when the source of pollution to the filterhouse is not being operated. (ADEM Admin. Code 335-3-1-.04)
- An emissions test on Stack 102 is to be conducted for total PM at intervals not to exceed one year following the date of previous compliance testing. All test reports must be submitted to the Department within 30 days of completion of testing. (ADEM Admin. Code 335-3-1-.04)

- An operations, maintenance, and monitoring plan must be submitted to the Administrator for review and approval as part of your application for the title V permit. (*40 CFR §63.1187(a) Subpart DDD*)
- The following procedures must be done to establish the average operating temperature of the curing oven incinerator:
  - During the performance test, the facility must establish the average operating temperature of an incinerator as follows:
    - Continuously measure the operating temperature of the incinerator.
    - Determine and record the average temperatures in consecutive 15-minute blocks.
    - Determine and record the arithmetic average of the recorded average temperatures measured in consecutive 15-minute blocks for each of the one-hour performance test runs.
    - Determine and record the arithmetic average of the three one-hour average temperatures during the performance test runs. The average of the three one-hour performance test runs establishes the temperature level to use to monitor compliance.
  - To comply with the requirements for maintaining the operating temperature of an incinerator after the performance test, the facility must measure and record the average operating temperature of the incinerator as required by §§63.1182 and 63.1183 of this subpart. This average operating temperature of the incinerator is based on the arithmetic average of the one-hour average temperatures for each consecutive three-hour period and is determined in the same manner described in paragraphs (a)(1) through (a)(4) of this section.
- The facility may change control device and process operating parameter levels established during performance tests and used to monitor compliance if you do the following:
  - The facility must notify the Administrator of your desire to expand the range of a control device or process operating parameter level.
  - Upon approval from the Administrator, you must conduct additional performance tests at the proposed new control device or process operating parameter levels. Before operating at these levels, the performance test results must verify that, at the new levels, you comply with the emission limits in §§63.1178 and 63.1179 of this subpart.
- The operations, maintenance, and monitoring plan must include the following: (*40 CFR §63.1187(b) Subpart DDD*)
  - Process and control device parameters you will monitor to determine compliance, along with established operating levels or ranges for each process or control device.
  - A monitoring schedule.

- Procedures for properly operating and maintaining control devices used to meet the standards in §§63.1178 and 63.1179 of this subpart. These procedures must include an inspection of each incinerator at least once per year. At a minimum, you must do the following as part of an incinerator inspection:
  - Inspect all burners, pilot assemblies, and pilot sensing devices for proper operation. Clean pilot sensor if necessary.
  - Ensure proper adjustment of combustion air, and adjust if necessary.
  - Inspect, when possible, all internal structures (such as baffles) to ensure structural integrity per the design specifications.
  - Inspect dampers, fans, and blowers for proper operation.
  - Inspect motors for proper operation.
  - Inspect, when possible, combustion chamber refractory lining. Clean, and repair or replace lining if necessary.
  - Inspect incinerator shell for proper sealing, corrosion, and/or hot spots.
  - For the burn cycle that follows the inspection, document that the incinerator is operating properly and make any necessary adjustments.
  - Generally observe whether the equipment is maintained in good operating condition.
  - Complete all necessary repairs as soon as practicable.
- Procedures for keeping records to document compliance.
- Corrective actions you will take if process or control device parameters vary from the levels established during performance testing.

**Recordkeeping and Reporting Requirements:**

- A semi-annual monitoring report shall be submitted to the Department according the following schedule: (*ADEM Admin. Code 335-3-16-.05(c)(3)*)

<b>Reporting Period</b>	<b>Due Date</b>
<i>January 1<sup>st</sup> to June 30<sup>th</sup></i>	<i>August 31<sup>st</sup></i>
<i>July 1<sup>st</sup> to December 31<sup>st</sup></i>	<i>February 28<sup>th</sup></i>

- A report shall be submitted semi-annually which contains the following:
  - The periods when the temperature of the afterburner on the curing oven was below 1200 °F and the corrective action take;
  - The periods when the pressure drops across the filterhouses were below the minimum pressure determined during the annual stack tests;
- All record shall be maintained for a minimum of 5 years. (*ADEM Admin. Code 335-3-16-.05(c)(2)*)
- This source shall comply with the notification requirements specified in 63.1191. (*40 CFR §63.1191 Subpart DDD*)



- The facility must meet the following recordkeeping requirements: (40 CFR §63.1192 Subpart DDD)
  - Maintain files of all information required by §63.10(b) of the general provisions in subpart A of this part, including all notifications and reports.
  - Maintain records of the following information also:
    - All bag leak detection system alarms. Include the date and time of the alarm, when corrective actions were initiated, the cause of the alarm, an explanation of the corrective actions taken, and when the cause of the alarm was corrected.
    - The free-formaldehyde content of each resin lot and the binder formulation, including formaldehyde content, of each binder batch used in the manufacture of bonded products.
    - Incinerator operating temperature and results of incinerator inspections. For all periods when the average temperature in any three-hour block period fell below the average temperature established during the performance test, and all periods when the inspection identified incinerator components in need of repair or maintenance, include the date and time of the problem, when corrective actions were initiated, the cause of the problem, an explanation of the corrective actions taken, and when the cause of the problem was corrected.
  - Retain each record for at least five years following the date of each occurrence, measurement, corrective action, maintenance, record, or report. The most recent two years of records must be retained at the facility. The remaining three years of records may be retained off site.
  - Retain records on microfilm, on a computer, on computer disks, on magnetic tape disks, or on microfiche.
  - Report the required information on paper or on a labeled computer disk using commonly available and compatible computer software.
- The facility must prepare and submit reports to the Administrator as required by this subpart and §63.10 of the general provisions in subpart A of this part. These reports include, but are not limited to, the following:
  - A performance test report, as required by §63.10(d)(2) of the general provisions in subpart A of this part, that documents the process and control equipment operating parameters during the test period, the test methods and procedures, the analytical procedures, all calculations, and the results of the performance tests.
  - A startup, shutdown, and malfunction plan, as described in §63.6(e)(3) of the general provisions in subpart A of this part, that contains specific procedures for operating and maintaining the source during periods of startup, shutdown, and malfunction and a program of corrective action for malfunctioning process and control systems used to comply with the emission standards. In addition to the information required by §63.6(e)(3), your plan must include the following:
    - Procedures to determine and record what caused the malfunction and when it began and ended.

- Corrective actions you will take if a process or control device malfunctions, including procedures for recording the actions taken to correct the malfunction or minimize emissions.
    - An inspection and maintenance schedule for each process and control device that is consistent with the manufacturer's instructions and recommendations for routine and long-term maintenance.
  - A report of each event as required by §63.10(b) of the general provisions in subpart A of this part, including a report if an action taken during a startup, shutdown, or malfunction is inconsistent with the procedures in the plan as described in §63.6(e)(3) of the general provisions in subpart A of this part.
  - An operations, maintenance, and monitoring plan as specified in §63.1187 of this subpart.
  - A semiannual report as required by §63.10(e)(3) of the general provisions in subpart A of this part if measured emissions exceed the applicable standard or a monitored parameter varies from the level established during performance testing. The report must contain the information specified in §63.10(c) of the general provisions, as well as the relevant records required by §63.1192(b) of this subpart.
  - A semiannual report stating that no excess emissions or deviations of monitored parameters occurred during the reporting period as required by §63.10(e)(3)(v) of the general provisions in subpart A of this part if no deviations have occurred.
- Semi-annual monitoring report required by 40 CFR 63 Subpart DDD shall be submitted to the Department according the following schedule: (40 CFR §60.10(a)(5))

<b>Reporting Period</b>	<b>Due Date</b>
<i>January 1<sup>st</sup> to June 30<sup>th</sup></i>	<i>August 31<sup>st</sup></i>
<i>July 1<sup>st</sup> to December 31<sup>st</sup></i>	<i>February 28<sup>th</sup></i>

#### Emissions:

Emission data is based on AP-42 emissions factor and mass balance. Per air permit application forms submitted, emissions from these units are as follows:

<b>Emission Point</b>	<b>Pollutant</b>	<b>Allowable Emissions</b>		<b>Expected Emissions</b>	
		<b>(lb/hr)</b>	<b>(TPY)</b>	<b>(lb/hr)</b>	<b>(TPY)</b>
102	CO			11.35	49.72
102	PM*	117.0	512.46	0.14	0.63
102	NO <sub>x</sub>			2.32	10.18
102	VOC			0.53	2.33
102	SO <sub>2</sub>			0.01	0.04
102	CO <sub>2</sub> e			1,991	8,723
102	Total HAP			0.48	2.11

\* - combined limit

## Mineral Wool Process – Eight (8) Pipe Insulation Lines

### Process Description:

The “logs” that were formed from the collection area are sent directly to one of the eight Pipe Insulation Lines or stored for later use in a Pipe Line. In a Pipe Line, the uncured mat log is unrolled and wrapped onto a mandrel. This forms the blanket into cylinders of a specified diameter. The mandrel may have a small gas burner to pre-heat it for the wrapping process. The uncured insulation on the mandrel is then fed into a curing oven where air heated by the oven gas burner passes through the oven to cure the insulation binder. A portion of the air that has been through the product to cure is drawn off and ducted to Filter House #2.

The Pipe insulation process consists of the following lines:

1. D3
2. SB1
3. MK2
4. A1
5. B1
6. D1
7. B2
8. B3

### Applicability:

- This source is subject to the applicable requirements of ADEM Admin. Code R. 335-3-16-.03, “*Major Source Operating Permits*”.
- This source is subject to ADEM Admin. Code R. 335-3-4-.04(1), “*Control of Particulate Emissions for Process Industries - General*”. However, this unit has PM limits in place which are more stringent.
- This unit is subject to ADEM Admin. Code R. 335-3-4-.01(1), “*Control of Particulate Emissions – Visible Emissions*”.
- This unit has enforceable limits in place in order to comply with the applicable provisions of ADEM Admin. Code R. 335-3-14-.04. “*Air Permits Authorizing Construction in Clean Air Areas [Prevention of Significant Deterioration]*”.
- Per §63.1177, a mineral wool production facility is subject to the applicable provisions of 40 CFR 63 Subpart DDD, “*National Emission Standards for Hazardous Air Pollutants for Mineral Wool Production*”.
- Per § 63.1194, a mineral wool production facility is subject to the applicable provisions of 40 CFR 63 Subpart A, “*General Provisions*” as listed in Table 1 of 40 CFR 63 Subpart DDD.

### Emissions Standards:

- **Opacity**
  - ADEM Admin. Code R. 335-3-4-.01(1)(a)(b), states no person shall discharge particulate emissions of an opacity greater than that designated as twenty (20%) opacity, as determined by a six minute average. During one six (6) minute period in any sixty (60) minute period, a person may discharge into the atmosphere from any source of emission forty (40%) percent opacity.
- **Particulate Matter**
  - The combined particulate matter (PM) emissions from processes the Cupola, Fiber Formation/Collection Process, Mineral Wool Process (Board Line), and Mineral Wool Process (Pipe Insulation Line) shall not exceed 117.0 (lb/hr) pounds per hour. (ADEM Admin. Code 335-3-14-.04(9) BACT)
- **Operating**
  - The baghouse shall not be bypassed during startup or for more than four (4) hours during shutdown periods. (ADEM Admin. Code 335-3-14-.04(9))
- **Formaldehyde**
  - Formaldehyde emissions from the curing process shall not exceed 0.17 lb per ton melt. (40 CFR §63.1178(a) Subpart DDD)
- **Methanol**
  - Methanol emissions from the curing process shall not exceed 0.28 lb per ton melt. (40 CFR §63.1178(a) Subpart DDD)
- **Phenol**
  - Phenol emissions from the curing process shall not exceed 0.85 lb per ton melt. (40 CFR §63.1178(a) Subpart DDD)

### Compliance and Performance Test Methods and Procedures:

- If testing is required, particulate matter emissions shall be determined by Method 5e of 40 CFR Part 60, Appendix A. (ADEM Admin. Code 335-3-1-.05)
- If testing is required, formaldehyde, phenol, and methanol emissions shall be determined by Method 318 of 40 CFR Part 60, Appendix A. (40 CFR §63.1189 Subpart DDD)
- To comply with the formaldehyde standards, the facility must meet all of the following: (40 CFR §63.1183 Subpart DDD)

- Install, calibrate, maintain, and operate a device that continuously measures the operating temperature in the firebox of each thermal incinerator.
- Do a performance test as specified in §63.1188 of this subpart while manufacturing the product that requires a binder formulation made with the resin containing the highest free-formaldehyde content specification range. Show compliance with the formaldehyde emission limits while the device for measuring incinerator operating temperature is installed, operational, and properly calibrated. Establish the average operating temperature as specified in §63.1185(a) of this subpart.
- During the performance test that uses the binder formulation made with the resin containing the highest free-formaldehyde content specification range, record the free-formaldehyde content specification range of the resin used, and the formulation of the binder used, including the formaldehyde content and binder specification.
- Following the performance test, monitor and record the free-formaldehyde content of each resin lot and the formulation of each batch of binder used, including the formaldehyde content.
- Maintain the free-formaldehyde content of each resin lot and the formaldehyde content of each binder formulation at or below the specification ranges established during the performance test.
- Following the performance test, measure and record the average operating temperature of the incinerator as specified in §63.1185(b) of this subpart.
- Maintain the operating temperature of the incinerator so that the average operating temperature for each three-hour block period never falls below the average temperature established during the performance test.
- Operate and maintain the incinerator as specified in your operations, maintenance, and monitoring plan required by §63.1187 of this subpart.
- With prior approval from the Administrator, the facility may do short-term experimental production runs using resin where the free-formaldehyde content, or binder formulations where the formaldehyde content, is higher than the specification ranges of the resin and binder used during previous performance tests, or using experimental pollution prevention process modifications without first doing additional performance tests. Notification of intent to perform a short-term experimental production run must include the following information:
  - The purpose of the experimental run.
  - The affected production process.
  - How the resin free-formaldehyde content or binder formulation will deviate from previously approved levels or what the experimental pollution prevention process modifications are.
  - The duration of the experimental run.
  - The date and time of the experimental run.
  - A description of any emissions testing to be done during the experimental run.

- The performance tests conducted to demonstrate compliance with the emissions limits in §63.1178 shall conform to the test methods and procedures specified in §63.1188 and §63.1189.
- Using the results of the performance tests, the facility must use the following equation to determine compliance with the CO and formaldehyde numerical emission limits: (40 CFR §63.1190 Subpart DDD)

$$E = \frac{C \times MW \times O \times K_1 \times K_2}{K_3 \times P \times 10^6}$$

where:

E = Emission rate of measured pollutant, kg/Mg (lb/ton) of melt.

C = Measured volume fraction of pollutant, ppm.

MW = Molecular weight of measured pollutant, g/g-mole:

Formaldehyde = 30.03.

Q = Volumetric flow rate of exhaust gases, dscm/hr (dscf/hr).

K<sub>1</sub>= Conversion factor, 1 kg/1,000 g (1 lb/453.6 g).

K<sub>2</sub>= Conversion factor, 1,000 L/m<sup>3</sup> (28.3 L/ft<sup>3</sup> ).

K<sub>3</sub>= Conversion factor, 24.45 L/g-mole.

P = Average melt rate, Mg/hr (ton/hr).

#### CAM Analysis:

Source	Pollutant	Pre-control Emissions (>100 TPY)?	Controlled?	Emission Limit?	CAM Applicable?	If not, why?
Pipe Lines	PM	No	Yes	Yes	No	<100 tpy
	VOC	No	No	No	No	Not controlled

### Emission Monitoring:

- A monitoring device that continuously measures and records the firebox temperature of the afterburner on the curing oven shall be installed, calibrated, maintained, and operated. (*ADEM Admin. Code 335-3-14-.04(9)*)
- Instruments which measure the pressure drop across the filterhouses shall be maintained and operated. (*ADEM Admin. Code 335-3-1-.04*)
- During the annual compliance test, minimum pressure drops shall be determined for the filterhouses. (*ADEM Admin. Code 335-3-1-.04*)
- Pressure drop across each filterhouse shall be monitored and recorded daily, except when the source of pollution to the filterhouse is not being operated. (*ADEM Admin. Code 335-3-1-.04*)
- An emissions test on Stack 102 is to be conducted for total PM at intervals not to exceed one year following the date of previous compliance testing. All test reports must be submitted to the Department within 30 days of completion of testing. (*ADEM Admin. Code 335-3-1-.04*)
- An operations, maintenance, and monitoring plan must be submitted to the Administrator for review and approval as part of your application for the title V permit. (*40 CFR §63.1187(a) Subpart DDD*)
- The following procedures must be done to establish the average operating temperature of the curing oven incinerator:
  - During the performance test, you must establish the average operating temperature of an incinerator as follows:
    - Continuously measure the operating temperature of the incinerator.
    - Determine and record the average temperatures in consecutive 15-minute blocks.
    - Determine and record the arithmetic average of the recorded average temperatures measured in consecutive 15-minute blocks for each of the one-hour performance test runs.
    - Determine and record the arithmetic average of the three one-hour average temperatures during the performance test runs. The average of the three one-hour performance test runs establishes the temperature level to use to monitor compliance.
  - To comply with the requirements for maintaining the operating temperature of an incinerator after the performance test, you must measure and record the average operating temperature of the incinerator as required by §§63.1182 and 63.1183 of this subpart. This average operating temperature of the incinerator is based on the arithmetic average of the one-hour average temperatures for each consecutive

three-hour period and is determined in the same manner described in paragraphs (a)(1) through (a)(4) of this section.

- The facility may change control device and process operating parameter levels established during performance tests and used to monitor compliance if you do the following:
  - The facility must notify the Administrator of your desire to expand the range of a control device or process operating parameter level.
  - Upon approval from the Administrator, you must conduct additional performance tests at the proposed new control device or process operating parameter levels. Before operating at these levels, the performance test results must verify that, at the new levels, you comply with the emission limits in §§63.1178 and 63.1179 of this subpart.
- The operations, maintenance, and monitoring plan must include the following: (*40 CFR §63.1187(b) Subpart DDD*)
  - Process and control device parameters you will monitor to determine compliance, along with established operating levels or ranges for each process or control device.
  - A monitoring schedule.
  - Procedures for properly operating and maintaining control devices used to meet the standards in §§63.1178 and 63.1179 of this subpart. These procedures must include an inspection of each incinerator at least once per year. At a minimum, you must do the following as part of an incinerator inspection:
    - Inspect all burners, pilot assemblies, and pilot sensing devices for proper operation. Clean pilot sensor if necessary.
    - Ensure proper adjustment of combustion air, and adjust if necessary.
    - Inspect, when possible, all internal structures (such as baffles) to ensure structural integrity per the design specifications.
    - Inspect dampers, fans, and blowers for proper operation.
    - Inspect motors for proper operation.
    - Inspect, when possible, combustion chamber refractory lining. Clean, and repair or replace lining if necessary.
    - Inspect incinerator shell for proper sealing, corrosion, and/or hot spots.
    - For the burn cycle that follows the inspection, document that the incinerator is operating properly and make any necessary adjustments.
    - Generally observe whether the equipment is maintained in good operating condition.
    - Complete all necessary repairs as soon as practicable.
  - Procedures for keeping records to document compliance.
  - Corrective actions you will take if process or control device parameters vary from the levels established during performance testing.

Recordkeeping and Reporting Requirements:



- Records shall be maintained of the sulfur content of the basalt used in the cupola. (*ADEM Admin. Code 335-3-1-.04*)
- A semi-annual monitoring report shall be submitted to the Department according the following schedule: (*ADEM Admin. Code 335-3-16-.05(c)(3)*)

<b>Reporting Period</b>	<b>Due Date</b>
<i>January 1<sup>st</sup> to June 30<sup>th</sup></i>	<i>August 31<sup>st</sup></i>
<i>July 1<sup>st</sup> to December 31<sup>st</sup></i>	<i>February 28<sup>th</sup></i>

- A report shall be submitted semi-annually which contains the following:
  - The periods when the temperature of the afterburner on the curing oven was below 1200 °F and the corrective action take;
  - The periods when the pressure drops across the filterhouses were below the minimum pressure determined during the annual stack tests;
- All record shall be maintained for a minimum of 5 years. (*ADEM Admin. Code 335-3-16-.05(c)(2)*)
- This source shall comply with the notification requirements specified in 63.1191. (*40 CFR §63.1191 Subpart DDD*)
- The facility must meet the following recordkeeping requirements: (*40 CFR §63.1192 Subpart DDD*)
  - Maintain files of all information required by §63.10(b) of the general provisions in subpart A of this part, including all notifications and reports.
  - Maintain records of the following information also:
    - All bag leak detection system alarms. Include the date and time of the alarm, when corrective actions were initiated, the cause of the alarm, an explanation of the corrective actions taken, and when the cause of the alarm was corrected.
    - The free-formaldehyde content of each resin lot and the binder formulation, including formaldehyde content, of each binder batch used in the manufacture of bonded products.
  - Retain each record for at least five years following the date of each occurrence, measurement, corrective action, maintenance, record, or report. The most recent two years of records must be retained at the facility. The remaining three years of records may be retained off site.
  - Retain records on microfilm, on a computer, on computer disks, on magnetic tape disks, or on microfiche.
  - Report the required information on paper or on a labeled computer disk using commonly available and compatible computer software.

- The facility must prepare and submit reports to the Administrator as required by this subpart and §63.10 of the general provisions in subpart A of this part. These reports include, but are not limited to, the following:
  - A performance test report, as required by §63.10(d)(2) of the general provisions in subpart A of this part, that documents the process and control equipment operating parameters during the test period, the test methods and procedures, the analytical procedures, all calculations, and the results of the performance tests.
  - A startup, shutdown, and malfunction plan, as described in §63.6(e)(3) of the general provisions in subpart A of this part, that contains specific procedures for operating and maintaining the source during periods of startup, shutdown, and malfunction and a program of corrective action for malfunctioning process and control systems used to comply with the emission standards. In addition to the information required by §63.6(e)(3), your plan must include the following:
    - Procedures to determine and record what caused the malfunction and when it began and ended.
    - Corrective actions you will take if a process or control device malfunctions, including procedures for recording the actions taken to correct the malfunction or minimize emissions.
    - An inspection and maintenance schedule for each process and control device that is consistent with the manufacturer's instructions and recommendations for routine and long-term maintenance.
  - A report of each event as required by §63.10(b) of the general provisions in subpart A of this part, including a report if an action taken during a startup, shutdown, or malfunction is inconsistent with the procedures in the plan as described in §63.6(e)(3) of the general provisions in subpart A of this part.
  - An operations, maintenance, and monitoring plan as specified in §63.1187 of this subpart.
  - A semiannual report as required by §63.10(e)(3) of the general provisions in subpart A of this part if measured emissions exceed the applicable standard or a monitored parameter varies from the level established during performance testing. The report must contain the information specified in §63.10(c) of the general provisions, as well as the relevant records required by §63.1192(b) of this subpart.
  - A semiannual report stating that no excess emissions or deviations of monitored parameters occurred during the reporting period as required by §63.10(e)(3)(v) of the general provisions in subpart A of this part if no deviations have occurred.

Emissions:

Emission data is based on AP-42 emissions factor and mass balance. Per air permit application forms submitted, emissions from these units are as follows:

Emission Point	Pollutant	Allowable Emissions		Expected Emissions	
		(lb/hr)	(TPY)	(lb/hr)	(TPY)
102	CO			2.04	8.96
102	PM*	117.0	512.46	0.18	0.78
102	NO <sub>x</sub>			0.26	1.11
102	SO <sub>2</sub>			0.24	1.06
102	VOC			3.04	13.32
102	CO <sub>2</sub> e			404	1,771
102	Total HAP			3.03	13.27

- - *combined limit*

**Recommendations:**

Based on the above analysis, I recommend that the IIG MinWool's existing Major Source Operating Permit (211-0013) be renewed with the conditions noted above, pending a public notice period and an EPA review:

\_\_\_\_\_  
Grace Hall  
Industrial Minerals Section  
Energy Branch  
Air Division

DRAFT  
Date